



Exercise 1 - Parallel Programming

Lecture: Parallel Programming, WS 2024/25
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- 1) Write a simple C program that calculates an approximation for Pi (π) using the Leibniz formula inside a loop:
$$\pi/4 = 1 - 1/3 + 1/5 - 1/7 + 1/9 - 1/11 + \dots$$

The number of iterations is to be defined within a variable or makro.
- 2) Try different iterations and check how many decimal places are displayed correctly.
 - a. Check the time the program takes to run by using the "time" command for execution.
 - b. What do the different times displayed in the terminal mean?
- 3) Now implement the program with POSIX threads (pthreads). Describe your program and find out what advantages/disadvantages the use of pthreads has for the program. Test how the runtimes of the program change when using different iterations (serial vs. different number of POSIX threads).
- 4) In preparation for the following task: Write a serial matrix-vector multiplication. The number of rows and columns in the matrix may be the same, as may the size of the vector. It should be possible to specify these sizes as a macro.